Sustainability Opportunity Areas Technical Memorandum

Prepared For:

Parsons Brinckerhoff

Prepared By:

Christopher B. Burke Engineering, Ltd.

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1.0 Overview

The proposed Illiana Corridor build alternatives will unavoidably impact people, landscape, flora, fauna, and water resources. This Technical Memorandum focuses on identifying at a broad scale a variety of post construction Best Management Practices (BMPs) and Sustainability Opportunity Areas. These concepts were then applied to various alternatives where the BMPs could be implemented to minimize or mitigate potential impacts of the Illiana Corridor project on wetlands, creeks, and other natural resources and the built environment.

The Sustainability Opportunity Areas were identified through a collaborative, interdisciplinary approach known as Context Sensitive Solutions (CSS). CSS implements theoretical and practical decision-making and takes into consideration the "context" of the surroundings, along with input from key project stakeholders. This process was used to identify appropriate BMPs that could be implemented to minimize impacts while appropriately fitting into the landscape.

The CSS process emphasizes that transportation facilities should fit within their physical settings and preserve scenic, aesthetic, historic, and environmental resources, while maintaining safety and mobility. CSS asserts that decisions should be responsive to the context of the footprint to the surrounding area, not simply responsive to the design process. CSS seeks to balance the need to move vehicles efficiently and safely with other desirable outcomes, including environmental sustainability. During the design process, opportunities are sought out to avoid, minimize, restore or enhance habitats to provide a net benefit to the environment. For instance, if a proposed highway passes through a wetland area, the roadway design should include elements that minimize the impact to the wetland, and also mitigates, to the extent possible, the impacts that would otherwise occur on an ecological and water quality basis.

Regional green infrastructure was also taken into consideration when identifying BMP Opportunity Areas.

As part of the Illiana Corridor roadway design, a suite of BMPs are being considered that would:

- Provide water quality protection or improvement by enhancing filtration and infiltration of stormwater prior to discharging from the site.
- Minimize impacts to wetland and waters of the U.S., as well as forested areas.
- Facilitate safer movement of terrestrial (flightless) wildlife across the project footprint.

The following provides a detailed description of the various BMPs listed in the legend of the concept plans. Appendices A and B include Sustainability Opportunity Area Concept Plans for each of the three mainline Alternatives 1, 2, and 3, and the IL-53 design options, respectively.

1.1 Water Quality Best Management Practices

Nearly all runoff draining from pavement or generated within the project constructed footprint will pass through a series of BMPs (Treatment Train) prior to discharging from the footprint. All of the BMP measures will filter runoff and, to some extent, promote infiltration of stormwater runoff; thereby minimizing the potential for surface water quality degradation.

Figure 1-1. BMP Opportunity Types

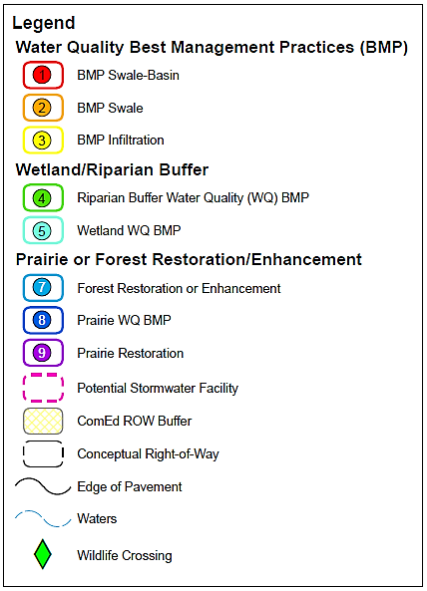
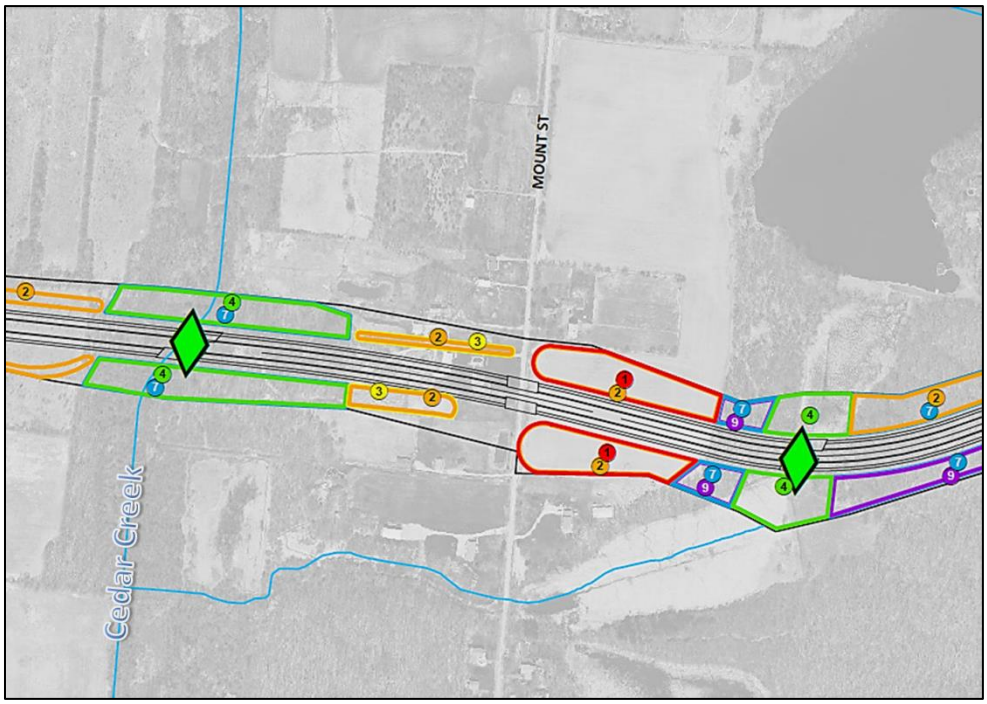


Figure 1-2. BMP Opportunity Area Example



1.1.1 BMP Swales/Basin

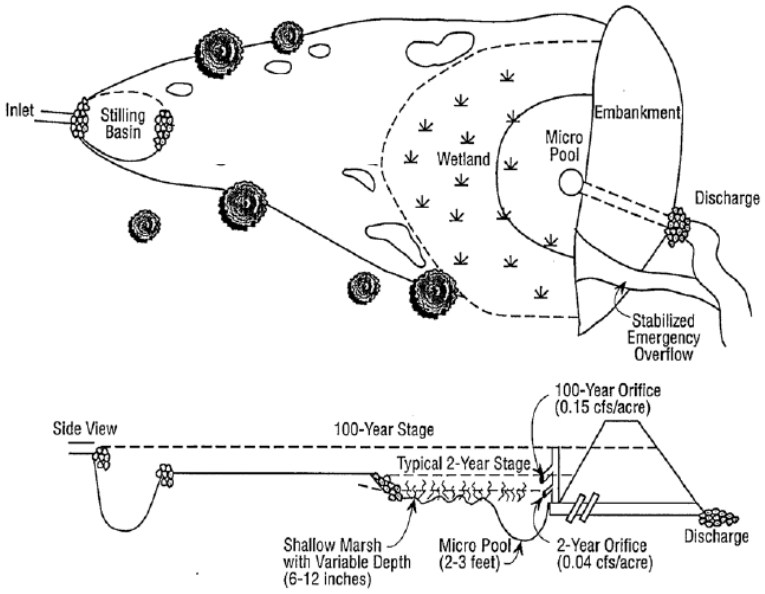
BMP swales and basins would be constructed along the roadside wherever they can physically be installed and provide a functional benefit. The BMP swales and basins may be designed with gravel bases that, to the extent possible, would be over-excavated to intersect with the underlying parent sands and gravels. The BMP swales and basins could be designed to capture a water quality volume which would reduce the total surface water discharge volume from the site. The BMP swales and basins would be planted with native vegetation, and undergo long term maintenance and management to promote native dominated plant communities.

Figure 1-3. Representative BMP Swale Basin View

BMP Swales/Basins would generally function as detention, compensatory flood storage and water quality treatment basins that are dual purposed as stormwater BMPs. These facilities would be established with native vegetation and typically have wetland bottoms. These areas would be designed to have native species, and if possible, based on the underlying geology, be designed to maximize infiltration through a connection to underlying sands and gravels. The basins would be designed to capture additional sediment, nutrients and oils that may not have been filtered out by other BMPs located upslope.

The detention basins would also be designed to capture a water quality volume resulting in a theoretical zero discharge of runoff generated from within the footprint for the design storm event. The current thinking is that the water quality volume would be based on a 0.75 inch event which correlates to approximately 88 percent of all rainfall events measured at O'Hare International Airport and 57 percent of the annual volume of precipitation. Rain events at or below this volume would be captured onsite and infiltrated, evaporated or evapotransporated.

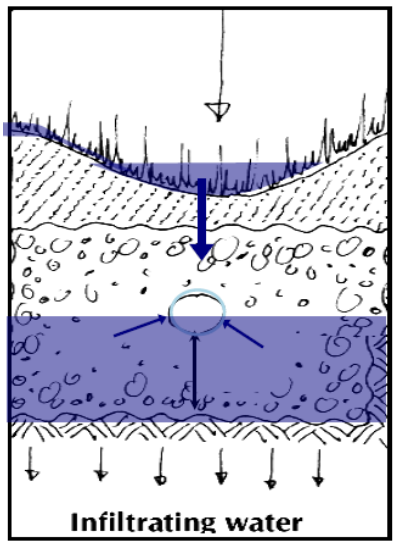
Figure 1-4. Representative BMP Basin Design



1.1.2 BMP Swale

BMP Swales are generally long narrow areas that under normal highway design circumstances would likely be a roadside ditch or swale that is modified to optimize pollutant removal. The bioswales would be designed to capture a water quality volume reducing the total stormwater discharge volume from the site. The bioswales would be designed to slow down flow velocities and increase residence time to maximize filtration of stormwater runoff reducing the total stormwater discharge from the site. The bioswales would be planted with native vegetation, and undergo long term maintenance and management.

Figure 1-5. BMP Swale Function



1.1.3 BMP Infiltration Area

BMP Infiltration Areas may be implemented in areas with limited work space or significant changes in elevation limiting the total surface area available to construct a full size facility. Infiltration BMPs can be small ponds which are intentionally tied into the underlying strata to promote groundwater recharge and limit surface water runoff. Or, BMP (leaky) catch basins could be installed to also promote filtration and infiltration. The infiltration catch basins would be integrated into the project design to work in conjunction with the installation of native-vegetated bioswales or other BMPs within roadside areas.

1.1.4 Manufactured or Structural BMPs

Manufactured or Structural BMPs typically consist of underground concrete structures used to filter runoff in locations where surface treatment is not possible. We did not explore their use for this report. Manufactured or Structural BMPs may be used if locations are identified during design which cannot accommodate a surface system, but sufficient treatment of runoff is necessary.

1.2 Riparian and Wetland Buffer Water Quality BMPs

Riparian and wetland buffer areas can be designed within farmland adjacent to existing wetland, waters, or floodplain within the project footprint. These BMPs would provide and create (with minimal grading effort) additional native habitat using the existing topography and hydrology of the land that would also help to filter runoff.

1.2.1 Riparian Area Water Quality BMP

A number of streams and ditches would be crossed by the project footprint. At many of these crossings, there are narrow strips of existing vegetation associated with the channel which transitions immediately to farm field. Each of these crossings was reviewed and, to the extent possible, a minimum 100 foot riparian buffer BMP area is proposed to be installed on both sides of the creek to provide water quality, wildlife, and bank stability benefits at each location. These areas would be established with native species selected for the expected hydrologic regimes at each location.

1.2.2 Wetland Water Quality BMP

Wetlands are scattered throughout the footprint, as are many poorly drained areas that appear to be farmed wetland (based on available aerial photography and topography). These farmed areas are sometimes isolated in fields or located in floodplain in close proximity to creeks, streams or ditches. These areas would require minimal effort to establish wetland habitats providing wildlife habitat and functioning as stormwater BMPs for the new roadway.

1.3 Prairie – Forest (Upland) Restoration/Enhancement Opportunity Areas

There are a number of areas where creeks, streams and rivers are crossed and where upland areas would remain within the footprint that with minimal effort could be restored to a native upland habitat. In addition, there are existing naturalized areas within the footprint that could undergo enhancement activities to improve their floristic quality and wildlife habitat value.

1.3.1 Forest Restoration/Enhancement Opportunity Areas

Several large forested areas will be crossed which contain farm field inclusions or are existing stands of woodland. In either case, these areas could benefit from establishment of additional woodland to fill in gaps to limit edge effect, or undergo enhancement to promote a predominance of native vegetation. These areas would provide improved wildlife habitat, and in some cases provide a water quality benefit by filtering roadway runoff.

1.3.2 Prairie Restoration Opportunity Areas

There are several large areas of upland that exist within the footprint that likely would not establish as wetland without extensive grading, but could be established as prairie to increase the overall coverage of natural area. These areas would provide a net ecological benefit by filtering runoff and providing wildlife habitat and native species diversity. An example includes the large proposed infield areas associated with the I-65/Illiana Corridor interchange.

1.3.3 Prairie Enhancement Opportunity Areas

Several large areas of existing upland vegetation could be restored as prairie to increase the overall coverage of natural areas. These areas may not be close enough to the roadway to function as a water quality BMP, but would provide benefits associated with native vegetated prairie areas.

1.4 Wildlife Crossings

A Wildlife Corridor Analysis was completed to evaluate the need to provide wildlife crossings. The findings of this evaluation can be found in a Technical Memorandum titled *Wildlife Corridor Analysis-Tier Two Illiana Corridor Study (2013).* The following summarizes the results of this analysis. The project team completed a preliminary review of streams and associated riparian areas crossed by the Illiana Corridor to assess their potential functions. The evaluation also took into account the regional green infrastructure network main goals identified by the Chicago Wilderness Alliance, in collaboration with the Chicago Metropolitan Agency for Planning (CMAP). Those goals include:

1. Conserve environmental quality strategically by protecting the most critical natural areas and conserving connectivity between them while acknowledging the need for development, and
2. Identify areas to protect based partly on the benefits they provide to people, such as flood storage, air emissions reduction, and water quality improvements.

In addition, the Illiana Corridor lies partially within the Kankakee Sands Conservation Opportunity Area (COA), which includes Midewin National Tallgrass Prairie and Goose Lake Prairie. The Illinois' Wildlife Action Plan includes an initial set of COAs that are priority areas for conserving Illinois' Species in Greatest Need of Conservation (SGNC). The riparian areas in the Illinois portion of the Illiana Corridor are a component of the Kankakee Sands COA.

The following data were evaluated for the stream and associated riparian areas as well as large wetland complexes crossed by the alternatives within the Corridor:

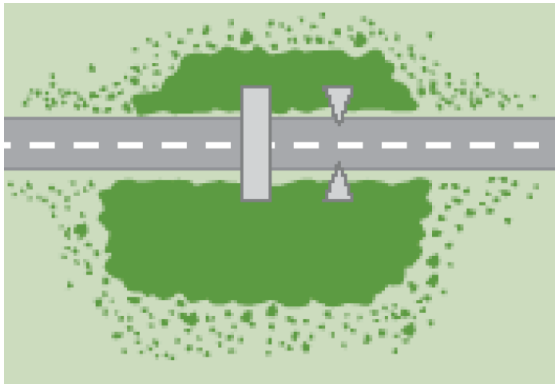
- Community type (i.e., woodland, prairie, savanna, wetland, etc.)
- Sites with Threatened and Endangered Species, Species of Concern, and Critical Habitat for listed species.
- Sites with Outstanding Remnants of Plant Communities (Floristic Inventories, if available)
- Areas adjacent to or connecting designated parks, forest preserves, etc.
- Future land use plans, local and regional
- Delineated wetlands in the Corridor
- Watershed plans, local and regional
- High resolution aerial photography (2012) of the Illiana Corridor for review of surface water features
- Historic aerial photography from Google Earth© and the University of Illinois, Illinois Geospatial Data Clearinghouse for various years, going back as far as the 1937-1947 Historic Aerial Photograph series.

The evaluation considered all stream/river crossings which number approximately 40 based on the current design. Of these, approximately 50 percent are proposed as bridges and the remainder proposed as culverts; however, the focus of this study is on those water courses which present the greatest opportunity to maintain or enhance wildlife passage in the study area.

Based on the analysis completed, the following 12 locations were recommended to include wildlife crossings.

- Illinois
  - Kankakee River
  - Unnamed Tributary of the Kankakee River
  - Forked Creek
  - South Branch Forked Creek
  - Black Walnut Creek
  - Pike Creek
- Indiana
  - Unnamed Tributary of West Creek #2
  - McConnell Ditch
  - Unnamed Tributary of McConnell Ditch
  - Cedar Creek
  - Wetland b-w31-pem (Tributary to Cedar Creek)

Figure 1-6. Illustrative Wildlife Crossing Overview



Source: USDOT FHWA Wildlife Crossing Structure Handbook, March 2011